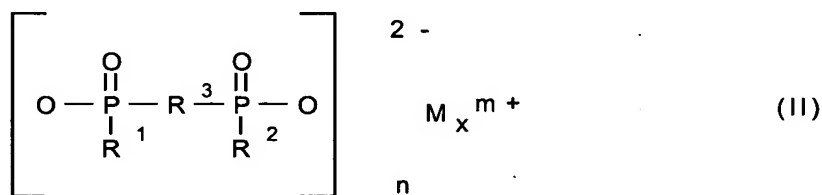
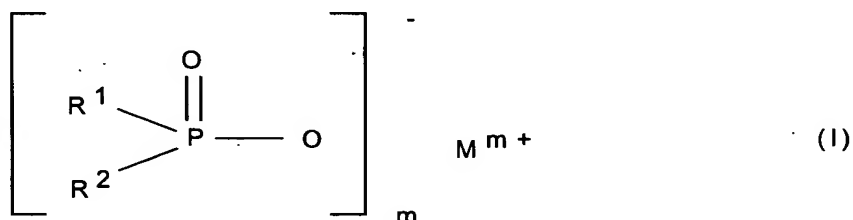


Patent Claims

1. A flame retardant and stabilizer combined, for thermoplastic polymers, which comprises, as component A, from 25 to 99.9% by weight of a phosphinic salt of the formula (I) and/or a diphosphinic salt of the formula (II) and/or polymers of these,



where

R^1, R^2 are identical or different and are C_1 - C_6 -alkyl, linear or branched, and/or aryl;

R^3 is C_1 - C_{10} -alkylene, linear or branched, C_6 - C_{10} -arylene, -alkylarylene or -arylalkylene;

M is Mg, Ca, Al, Sb, Sn, Ge, Ti, Zn, Fe, Zr, Ce, Bi, Sr, Mn, Li, Na, K, and/or a protonated nitrogen base;

m is 1 to 4;

n is 1 to 4;

x is 1 to 4,

and comprises, as component B, from 10 to 75% by weight of a nitrogen-containing synergist or of a phosphorus/nitrogen flame retardant, and comprises, as component C, from 0.1 to 50% by weight of a basic or

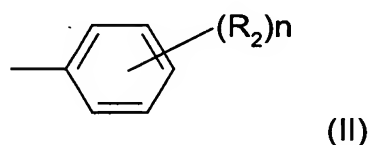
amphoteric oxide, hydroxide, carbonate, silicate, borate, stannate, mixed oxide/hydroxide, oxide/hydroxide/carbonate, hydroxide/silicate, or hydroxide/borate, or a mixture of these substances, and comprises, as component D, from 0 to 5% by weight of a phosphonite of the structure



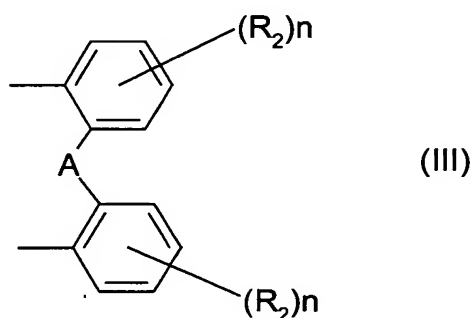
where

R is a mono- or polyvalent aliphatic, aromatic, or heteroaromatic organic radical, and

R₁ is a compound of the structure (II)



or the two radicals R₁ form a bridging group of the structure (III)



where

A is a direct bond, O, S, C₁₋₁₈-alkylene (linear or branched), C₁₋₁₈-alkylidene (linear or branched),

where

R₂ independently of one another, are C₁₋₁₂-alkyl (linear or branched), C₁₋₁₂-alkoxy, C₅₋₁₂-cycloalkyl, and

n is from 0 to 5, and

m is from 1 to 4,
and comprises, as component E, from 0 to 5% by weight of an ester or salt of montan wax acid, and comprises, as component F, from 0.1 to 5% by weight of an N,N'-bispiperidinyl-1,3-benzenedicarboxamide and/or N,N'-bis(2,2,6,6-tetramethyl-4-piperidinyl)-1,3-benzenedicarboxamide, the entirety of the components always being 100% by weight.

2. The flame retardant and stabilizer combined, as claimed in claim 1, wherein R^1 and R^2 are identical or different, and are C_1 - C_6 -alkyl, linear or branched, and/or phenyl.
3. The flame retardant and stabilizer combined, as claimed in claim 1 or 2, wherein R^1 and R^2 are identical or different and are methyl, ethyl, n-propyl, isopropyl, n-butyl, tert-butyl, n-pentyl and/or phenyl.
4. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 3, wherein R^3 is methylene, ethylene, n-propylene, isopropylene, n-butylene, tert-butylene, n-pentylene, n-octylene or n-dodecylene; phenylene or naphthylene; methylphenylene, ethylphenylene, tert-butylphenylene, methylnaphthylene, ethylnaphthylene or tert-butylphenylene; phenylmethylene, phenylethylene, phenylpropylene, or phenylbutylene.
5. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 4, wherein M is calcium ions, aluminum ions, or zinc ions.
6. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 5, wherein component B comprises condensation products of melamine.
7. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 6, wherein the condensation products of melamine

comprise melem, melam, melon and/or compounds thereof having higher condensation levels.

8. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 5, wherein component B comprises reaction products of melamine with polyphosphoric acid and/or comprises reaction products of condensation products of melamine with polyphosphoric acid, or comprises a mixture thereof.

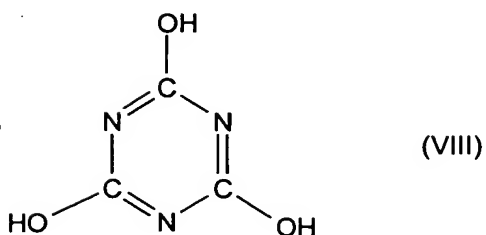
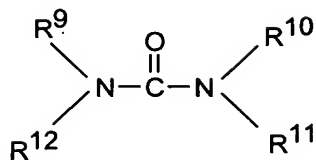
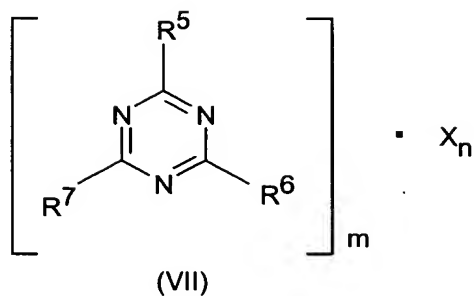
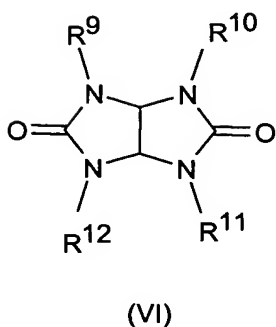
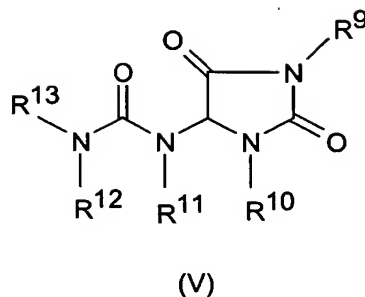
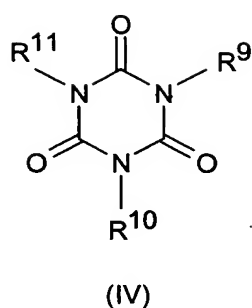
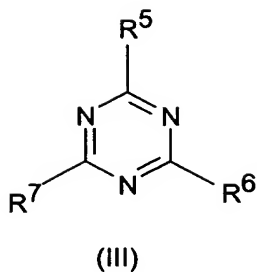
9. The flame retardant and stabilizer combined, as claimed in claim 8, wherein the reaction products comprise dimelamine pyrophosphate, melamine polyphosphate, melem polyphosphate, melam polyphosphate, melon polyphosphate and/or mixed polysalts of this type.

10. The flame retardant and stabilizer combined, as claimed in claim 9, wherein component B comprises melamine polyphosphate.

11. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 5, wherein the phosphorus/nitrogen flame retardants comprise nitrogen-containing phosphates of the formula $(\text{NH}_4)_y \text{H}_{3-y} \text{PO}_4$ or $(\text{NH}_4 \text{PO}_3)_z$, where y is from 1 to 3, and z is from 1 to 10 000.

12. The flame retardant and stabilizer combined, as claimed in claim 11, wherein the phosphorus/nitrogen flame retardants comprise ammonium hydrogenphosphate, ammonium dihydrogenphosphate, and/or ammonium polyphosphate.

13. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 5, wherein the nitrogen-containing synergists comprise those of the formulae (III) to (VIII), or a mixture of these



where

R^5 to R^7 are hydrogen, C_1 - C_8 -alkyl, C_5 - C_{16} -cycloalkyl or -alkylcycloalkyl, optionally substituted with a hydroxy or a C_1 - C_4 -hydroxyalkyl function, C_2 - C_8 -alkenyl, C_1 - C_8 -alkoxy, -acyl, -acyloxy, C_6 - C_{12} -aryl or -arylalkyl, $-OR^8$, or $-N(R^8)R^9$, or else a system of N-alicyclic or N-aromatic nature,

R^8 is hydrogen, C_1 - C_8 -alkyl, C_5 - C_{16} -cycloalkyl or -alkylcycloalkyl, optionally substituted with a hydroxy or a C_1 - C_4 -hydroxyalkyl

function, C₂-C₈-alkenyl, C₁-C₈-alkoxy, -acyl, -acyloxy, or C₆-C₁₂-aryl or -arylalkyl,

R⁹ to R¹³ are the same as the groups for R⁸, or else -O-R⁸,

m and n independently of one another, are 1, 2, 3, or 4,

X is acids which can form adducts with triazine compounds (III); or comprise oligomeric esters of tris(hydroxyethyl) isocyanurate with aromatic polycarboxylic acids.

14. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 13, wherein the nitrogen-containing synergists comprise benzoguanamine, tris(hydroxyethyl) isocyanurate, allantoin, glycoluril, melamine, melamine cyanurate, dicyandiamide and/or guanidine.

15. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 14, which comprises carbodiimides.

16. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 15, wherein component C comprises magnesium oxide, calcium oxide, aluminum oxide, zinc oxide, manganese oxide, and/or tin oxide.

17. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 15, wherein component C comprises aluminum hydroxide, boehmite, dihydrotalcite, hydrocalumite, magnesium hydroxide, calcium hydroxide, zinc hydroxide, tin oxide hydrate, manganese hydroxide, zinc borate, basic zinc silicate or zinc stannate.

18. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 17, which comprises from 50 to 90% by weight of component A, from 0 to 50% by weight of component B, from 1 to 20% by weight of component C, from 0 to 5% by weight of component D, from 0 to 5% by weight of component E, and from 0.1 to 5% by weight of component F.

19. The flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 18, which comprises from 50 to 80% by weight of component A, from 20 to 50% by weight of component B, from 2 to 20% by weight of component C, from 0 to 3% by weight of component D, from 0 to 3% by weight of component E, and from 0.1 to 4% by weight of component F.

20. A flame-retardant plastics molding composition, comprising a flame retardant and stabilizer combined, as claimed in one or more of claims 1 to 19.

21. The flame-retardant plastics molding composition as claimed in claim 20, wherein the plastic comprises thermoplastic polymers of the type represented by HI (high-impact) polystyrene, polyphenylene ethers, polyamides, polyesters, polycarbonates, and blends or polyblends of the type represented by ABS (acrylonitrile-butadiene-styrene) or PC/ABS (polycarbonate/acrylonitrile-butadiene-styrene), or PPE/HIPS (polyphenylene ether/HI polystyrene) plastics.

22. The flame-retardant plastics molding composition as claimed in claim 20 or 21, wherein the plastic comprises polyamide.

23. The flame-retardant plastics molding composition as claimed in one or more of claims 20 to 22, which, based on the plastics molding composition, comprises from 2 to 50% by weight of the flame retardant and stabilizer combined.

24. The flame-retardant plastics molding composition as claimed in one or more of claims 20 to 23, which, based on the plastics molding composition, comprises from 10 to 30% by weight of the flame retardant and stabilizer combined.

25. The flame-retardant plastics molding composition as claimed in one or more of claims 20 to 24, which comprises the flame retardant and stabilizer combined, constituted as claimed in claim 20.

26. A polymer molding, a polymer film, a polymer filament, or a polymer fiber comprising a flame retardant/stabilizer composition, as claimed in one or more of claims 1 to 19.

27. The polymer molding, polymer film, polymer filament, or polymer fiber as claimed in claim 26, wherein the polymer comprises HI (high-impact) polystyrene, polyphenylene ethers, polyamides, polyesters, polycarbonates, and blends or polyblends of the type represented by ABS (acrylonitrile-butadiene-styrene), or PC/ABS (polycarbonate/acrylonitrile-butadiene-styrene).

28. The polymer molding, polymer film, polymer filament, or polymer fiber as claimed in claim 26 or 27, which, based on the polymer content, comprises an amount of from 2 to 50% by weight of the flame retardant and stabilizer combined.

29. The polymer molding, polymer film, polymer filament, or polymer fiber as claimed in one or more of claims 26 to 28, which, based on the polymer content, comprises an amount of from 10 to 30% by weight of the flame retardant and stabilizer combined.

30. The polymer molding, polymer film, polymer filament, or polymer fiber as claimed in one or more of claims 26 to 29, which comprises the flame retardant and stabilizer combined, constituted as claimed in claim 15.